Normal Distribution

The **normal distribution**, or *Gaussian distribution*, is a symmetrical distribu commonly referred to as the *bell curve*. It can be considered as a special ca binomial distribution with a very large number of trials ($n \to \infty$) and an equ success/failure rate ($p = q = 0.5$).

Suppose that the mean value and standard deviation of a normal distributio and σ, respectively. The normal distribution has the following important pro See plots of normal distributions.

Normal Distribution

Density Function $f(x)$	$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\left\{(x-\mu)^2 / 2\sigma\right.}$
Distribution Function $F(x)$	$F(x) = \frac{1}{\sigma\sqrt{2\pi}} \int_{-\infty}^{x} e^{-\left\{(\nu-\mu)^2 / 2\right.}$
Mean μ	μ
Variance σ^2	σ^2
Standard Deviation σ	σ

Uniform Distribution

The **uniform distributi n** has a *constant* success rate on the interval $a \le x$ zero success rate anywhere else. The uniform distribution has the following properties. See plots of uniform distributions.

Unif rm Distribution

Density Function $f(x)$	$f(x)=\begin{cases}\frac{1}{b-a} & a\leq b\\ 0 & \text{otherwis}\end{cases}$
Distribution Function $F(x)$	$F(x)=\begin{cases}0 & x<a\\ \frac{x-a}{b-a} & a\leq x\leq b\\ 1 & x>b\end{cases}$
Mean μ	$\mu=\frac{a+b}{2}$
Variance σ^2	$\sigma^2=\frac{(b-a)^2}{12}$
Standard Deviation σ	$\sigma=\frac{b-a}{2\sqrt{3}}$

Exponential Distribution

The **Exponential distribution** arises in the calculations of reliability. It is si Poisson distribution with $x=0$ and the probability of the desired outcome d as the trial number increases ($\lim_{n\to\infty} p=0$). See plots of exponential distrib

Exponential Distribution

Density Function $f(x)$	$f(x)=\begin{cases}\lambda e^{-\lambda x} & x\geq 0\\ 0 & x<0\end{cases}$
Distribution Function $F(x)$	$F(x)=\begin{cases}1-e^{-\lambda x} & x\geq 0\\ 0 & x<0\end{cases}$
Mean μ	$\mu=1/\lambda$
Variance σ^2	$\sigma^2=1/\lambda^2$
Standard Deviation σ	$\sigma=1/\lambda$

where $\lambda=\text{constant}>0$.